

FORM PTO-1390
(REV. 12-2001)

U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

ATTORNEY'S DOCKET NUMBER

TRANSMITTAL LETTER TO THE UNITED STATES
DESIGNATED/ELECTED OFFICE (DO/EO/US)
CONCERNING A FILING UNDER 35 U.S.C. 371

1406/41

U.S. APPLICATION NO. (If known, see 37 CFR 1.5

10/048050

INTERNATIONAL APPLICATION NO.
PCT/DE00/02355INTERNATIONAL FILING DATE
19 July 2000 (19.07.00)PRIORITY DATE CLAIMED
28 July 1999 (28.07.99)

TITLE OF INVENTION

METHOD AND DEVICE FOR ISDN/ADSL JOINT DATA TRANSFER

APPLICANT(S) FOR DO/EO/US INFINEON TECHNOLOGIES AG; FRENZEL, Rudi and HOEFER, Gerald

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☐ This is an express request to begin national examination procedures (35 U.S.C. 371(f)). The submission must include items (5), (6), (9) and (21) indicated below.
4. ☒ The US has been elected by the expiration of 19 months from the priority date (Article 31).
5. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2))
 - a. ☐ is attached hereto (required only if not communicated by the International Bureau).
 - b. ☒ has been communicated by the International Bureau.
 - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☒ An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)).
 - a. ☒ is attached hereto.
 - b. ☐ has been previously submitted under 35 U.S.C. 154(d)(4).
7. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
 - a. ☐ are attached hereto (required only if not communicated by the International Bureau).
 - b. ☐ have been communicated by the International Bureau.
 - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
 - d. ☒ have not been made and will not be made.
8. ☐ An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371 (c)(3)).
9. ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10. ☒ An English language translation of the annexes of the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11 to 20 below concern document(s) or information included:

11. ☐ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. ☐ An assignment document for recording. A separate copy
13. ☒ A **FIRST** preliminary amendment.
14. ☐ A **SECOND** or **SUBSEQUENT** preliminary amendment
15. ☐ A substitute specification.
16. ☐ A change of power of attorney and/or address letter.
17. ☐ A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U.S.C. 1.821 - 1.825.
18. ☐ A second copy of the published international application under 35 U.S.C. 154(d)(4).
19. ☐ A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4).
20. ☒ Other items or information:

Copy of Published PCT Application w/ International Search Report; PCT/IPEA/409

"Express Mail" mailing number EVO23031496US
 Date of Deposit 25.1.02
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 Washington, D.C. 20231
 April N. Williams

April N. Williams

U.S. APPLICATION NO. (if known, see 37 CFR 1.5)

107048050

INTERNATIONAL APPLICATION NO

PCT/DE00/02355

ATTORNEY'S DOCKET NUMBER

1406/41

21. ☒ The following fees are submitted:

BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)):

Neither international preliminary examination fee (37 CFR 1.482)
nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO
and International Search Report not prepared by the EPO or JPO \$1040.00

International preliminary examination fee (37 CFR 1.482) not paid to
USPTO but International Search Report prepared by the EPO or JPO \$890.00

International preliminary examination fee (37 CFR 1.482) not paid to USPTO
but international search fee (37 CFR 1.445(a)(2)) paid to USPTO \$740.00

International preliminary examination fee (37 CFR 1.482) paid to USPTO
but all claims did not satisfy provisions of PCT Article 33(I)-(4) \$710.00

International preliminary examination fee (37 CFR 1.482) paid to USPTO
and all claims satisfied provisions of PCT Article 33(I)-(4) \$100.00

ENTER APPROPRIATE BASIC FEE AMOUNT =

CALCULATIONS PTO USE ONLY

\$ 890.00

Surcharge of \$130.00 for furnishing the oath or declaration later than ☐ 20 ☐ 30
months from the earliest claimed priority date (37 CFR 1.492(e)).

\$ 0.00

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE	
Total claims	8 - 20 =	0	x \$18.00	\$ 0.00
Independent claims	1 - 3 =	0	x \$84.00	\$ 0.00
MULTIPLE DEPENDENT CLAIM(S) (if applicable)			+ \$280.00	\$ 0.00

TOTAL OF ABOVE CALCULATIONS = \$ 890.00

☐ Applicant claims small entity status. See 37 CFR 1.27. The fees indicated above
are reduced by 1/2.

\$ 0.00

SUBTOTAL = \$ 890.00

Processing fee of \$130.00 for furnishing the English translation later than ☐ 20 ☐ 30
months from the earliest claimed priority date (37 CFR 1.492(f)).

\$ 0.00

TOTAL NATIONAL FEE = \$ 890.00

Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be
accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property +

\$ 0.00

TOTAL FEES ENCLOSED = \$ 890.00

Amount to be
refunded: \$

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- a. ☒ A check in the amount of \$ 890.00 to cover the above fees is enclosed.
- b. ☐ Please charge my Deposit Account No. _____ in the amount of \$ _____ to cover the above fees.
A duplicate copy of this sheet is enclosed.
- c. ☒ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any
overpayment to Deposit Account No. 50-0426 A duplicate copy of this sheet is enclosed.
- d. ☐ Fees are to be charged to a credit card. **WARNING:** Information on this form may become public. **Credit card
information should not be included on this form.** Provide credit card information and authorization on PTO-2038.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR
1.137 (a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

Richard E. Jenkins
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Richard E. Jenkins
SIGNATURE

Richard E. Jenkins

NAME

28,428

REGISTRATION NUMBER



25297

PATENT TRADEMARK OFFICE

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I hereby certify that this paper or fee is being deposited with the United States Postal Service "Express Mail to Addressee" service under 37 C.F.R. 1.10 on the date indicated above and is addressed to the Commissioner for Patents, PO Box 2327, Arlington, VA 22202
April N. Williams

April N. Williams

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Frenzel et al.

Group Art Unit: Not Assigned

Serial No.: Not Assigned

Examiner: Not Assigned

Filed: Herewith

Docket No.: 1406/41

For: METHOD AND DEVICE FOR ISDN/ADSL JOINT DATA TRANSFER

PRELIMINARY AMENDMENT

Honorable Commissioner for Patents
BOX PCT
Washington, D.C. 20231

Dear Sir:

Kindly amend the subject application as follows:

IN THE SPECIFICATION:

Please insert the paragraph heading on page 1 of the English translation of the Annex to PCT/IPEA/409, line 5, as follows:

--Technical Field--.

Please insert the paragraph heading on page 1 of the English translation of the Annex to PCT/IPEA/409, before line 10, as follows:

--Background Art--.

Please insert the paragraph heading on page 2 of the English translation of the subject application, before line 32, as follows:

--Summary of the Invention--.

Please insert the paragraph heading on page 4 of the English translation of the Annex to PCT/IPEA/409, before line 19, as follows:

--Brief Description of the Drawings--.

Please insert the paragraph heading on page 5 of the English translation of the subject application, before line 1, as follows:

--Detailed Description of the Invention--.

IN THE CLAIMS:

Please delete the paragraph heading on page 1 of the English translation of the Annex to PCT/IPEA/409, line 1, and insert in place thereof the paragraph heading as follows:

--CLAIMS--

Please insert the paragraph heading on page 1 of the English translation of the Annex to PCT/IPEA/409, before claim 1, the following:

-- What is claimed is: --.

Please amend claims 1-8 as follows:

1. (Amended) Method for joint transmission of ISDN and ADSL data between a first station and a second station via a transmission line, having the following steps:

modulation of an ISDN data stream by means of an ADSL modulator to form an ADSL data stream in the first station for transmission as a mixed data stream in the current upstream direction to the second station, with the ISDN data stream in the mixed data stream in the current upstream direction being modulated onto carrier frequencies, which are reserved for this purpose, in a first frequency band, and the ADSL data stream in the mixed data stream in the current upstream direction being modulated above the first frequency band;

demodulation of the mixed data stream in the second station by means of an ADSL demodulator to form a corresponding transmitted ADSL data stream and a corresponding transmitted ISDN data stream;

modulation of an ISDN data stream by means of an ADSL modulator to form an ADSL data stream in the second station for transmission as a mixed data stream in the current downstream direction to the first station, with the ADSL data stream in the mixed data stream in the current downstream direction being modulated in a second frequency band above the first frequency band; and

demodulation of the mixed data stream in the first station by means of an ADSL demodulator to form a corresponding transmitted ADSL data stream and a corresponding transmitted ISDN data stream.

2. (Amended) Method according to Claim 1, wherein the first frequency band is between 0 and 138 kHz, preferably between 0 and 25 kHz.

3. (Amended) Method according to claim 1, wherein the second frequency band is between 138 and 1100 kHz, preferably between 138 and 550 kHz.

4. (Amended) Method according to claim 1, wherein the first frequency band has a moveable upper limit for the ADSL modulated ISDN data stream.

5. (Amended) Method according to claim 1, wherein the first station is a home station, and the second station is a central office station.

6. (Amended) Apparatus for joint transmission of ISDN and ADSL data by means of the method according to claim 1, having:

an ISDN transceiver, which is provided in the first station for transmission and reception of the ISDN data stream and is connected firstly to the ADSL modulator and secondly to an ISDN terminal, preferably an ISDN telephone.

7. (Amended) Apparatus according to Claim 6, wherein at least one SLIC/CODEC device is provided in the first station, and is connected firstly to the ADSL modulator and secondly to an analogue terminal, preferably to an analogue telephone.

8. (Amended) Apparatus according to Claim 7, wherein a relay device is connected between the at least one SLIC/CODEC device and the transmission line, in order to provide an emergency power function.

REMARKS

The amendments to the specification as set forth above are intended to clarify and set apart the various sections of the subject application.

The amendments to the claims as set forth above are intended to remove all multiple dependent claims from the subject application and to more particularly point out and distinctly claim the subject invention.

Attached hereto is a marked-up version of the specification and claims 1-8, which illustrates all of the changes made to the specification and claims pursuant to 37 CFR §1.121. The attached page is captioned "**Version With Markings To Show Changes Made**". Deleted language is bracketed and added language is underlined.

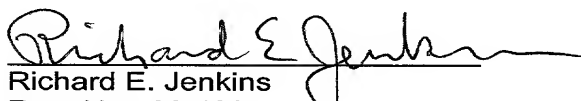
The Commissioner is hereby authorized to charge any deficiencies or credit any overpayments in connection with the filing of this correspondence to Deposit Account No. **50-0426**.

Respectfully submitted,

JENKINS & WILSON, P.A.

Date: 1-25-02

By:


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25297

PATENT TRADEMARK OFFICE

1406/41

REJ/lsg

Serial No.: Not yet assigned

Version With Markings To Show Changes Made

IN THE SPECIFICATION:

The paragraph heading has been inserted on page 1 of the English translation of the Annex to PCT/IPEA/409, line 5, as follows:

Technical Field

The paragraph heading has been inserted on page 1 of the English translation of the Annex to PCT/IPEA/409, before line 10, as follows:

Background Art

The paragraph heading has been inserted on page 2 of the English translation of the subject application, before line 32, as follows:

Summary of the Invention

The paragraph heading has been inserted on page 4 of the English translation of the Annex to PCT/IPEA/409, before line 19, as follows:

Brief Description of the Drawings

The paragraph heading has been inserted on page 5 of the English translation of the subject application, before line 1, as follows:

Detailed Description of the Invention

IN THE CLAIMS:

The paragraph heading "Patent Claims" on page 8 of the English translation of the Annex to PCT/IPEA/409 has been deleted and the paragraph heading has been inserted in place thereof as follows:

CLAIMS

The paragraph heading has been inserted on page 8 of the English translation of the Annex to PCT/IPEA/408, before claim 1, as follows:

What is claimed is:

1. (Amended) Method for joint transmission of ISDN and ADSL data between a first station [(10)] and a second station [(20)] via a transmission line [(1020)], having the following steps:

modulation of an ISDN data stream [(1012)] by means of an ADSL modulator [(101)] to form an ADSL data stream [(1011)] in the first station [(10)] for transmission as a mixed data stream in the current upstream direction to the second station [(20)], with the ISDN data stream in the mixed data stream in the current upstream direction being modulated onto carrier frequencies, which are reserved for this purpose, in a first frequency band, and the ADSL data stream in the mixed data stream in the current upstream direction being modulated above the first frequency band;

demodulation of the mixed data stream in the second station [(20)] by means of an ADSL demodulator [(201)] to form a corresponding transmitted ADSL

data stream [(2011)] and a corresponding transmitted ISDN data stream [(2012)];

modulation of an ISDN data stream [(2012)] by means of an ADSL modulator [(201)] to form an ADSL data stream [(2011)] in the second station [(20)] for transmission as a mixed data stream in the current downstream direction to the first station [(10)], with the ADSL data stream in the mixed data stream in the current downstream direction being modulated in a second frequency band above the first frequency band; and

demodulation of the mixed data stream in the first station [(10)] by means of an ADSL demodulator [(101)] to form a corresponding transmitted ADSL data stream [(1011)] and a corresponding transmitted ISDN data stream [(1012)].

2. (Amended) Method according to Claim 1, [characterized in that] wherein the first frequency band is between 0 and 138 kHz, preferably between 0 and 25 kHz.

3. (Amended) Method according to [one of the preceding claims, characterized in that] claim 1, wherein the second frequency band is between 138 and 1100 kHz, preferably between 138 and 550 kHz.

4. (Amended) Method according to [one of the preceding claims, characterized in that] claim 1, wherein the first frequency band has a moveable upper limit for the ADSL modulated ISDN data stream.

5. (Amended) Method according to [one of the preceding claims, characterized in that] claim 1, wherein the first station [(10)] is a home station, and the second station [(20)] is a central office station.

6. (Amended) Apparatus for joint transmission of ISDN and ADSL data by means of the method according to [one of the preceding claims] claim 1, having:

an ISDN transceiver [(102)], which is provided in the first station [(10)] for transmission and reception of the ISDN data stream [(1012)] and is connected firstly to the ADSL modulator [(101)] and secondly to an ISDN terminal, preferably an ISDN telephone.

7. (Amended) Apparatus according to Claim 6, [characterized in that] wherein at least one SLIC/CODEC device [(103, 104)] is provided in the first station [(10)], and is connected firstly to the ADSL modulator [(101)] and secondly to an analogue terminal, preferably to an analogue telephone.

8. (Amended) Apparatus according to Claim 7, [characterized in that] wherein a relay device [(105)] is connected between the at least one SLIC/CODEC device [(104)] and the transmission line [(1020)], in order to provide an emergency power function.

Description

Method and apparatus for joint transmission of ISDN and ADSL data

5

The present invention relates to a method and an apparatus for joint transmission of ISDN and ADSL data between a first station and a second station.

10 It is known from US-A-5,596,604 for an ISDN data stream to be modulated by means of an ADSL modulator to form an ADSL data stream for transmission as a mixed data stream.

15 US-A-5,757,803 relates to a POTS (Plain Old Telephone Service) splitter arrangement having an improved transhybrid loss for digital subscriber loop transmission. The splitter arrangement is used to split the subscriber loop into a first transmission path
20 including a low-pass filter, which allows telephone service power signal transmissions to continue along the subscriber loop, and a second signal transmission path, with the second signal transmission path having a capacitive element for attenuating the telephone
25 service power signals.

US-A-5,742,527 describes a flexible ADSL receiver (ADSL = Asymmetrical Digital Subscriber Line). In this known ADSL receiver, the bandwidth up to 138 kHz is reserved
30 for ISDN transmission (ISDN = Integrated Service Digital Network), and the upstream (current upstream direction) channel of the ADSL starts from one 138 kHz, with the downstream (current downstream direction) channel being specifically shifted.

35

In the recent past, various options have been implemented to allow ADSL data to be transmitted in parallel with ISDN data. All these known proposals have

required two modulators, to be precise in each case one for the ISDN data and a further modulator for the ADSL data, with a specific frequency band being reserved for each modulation scheme.

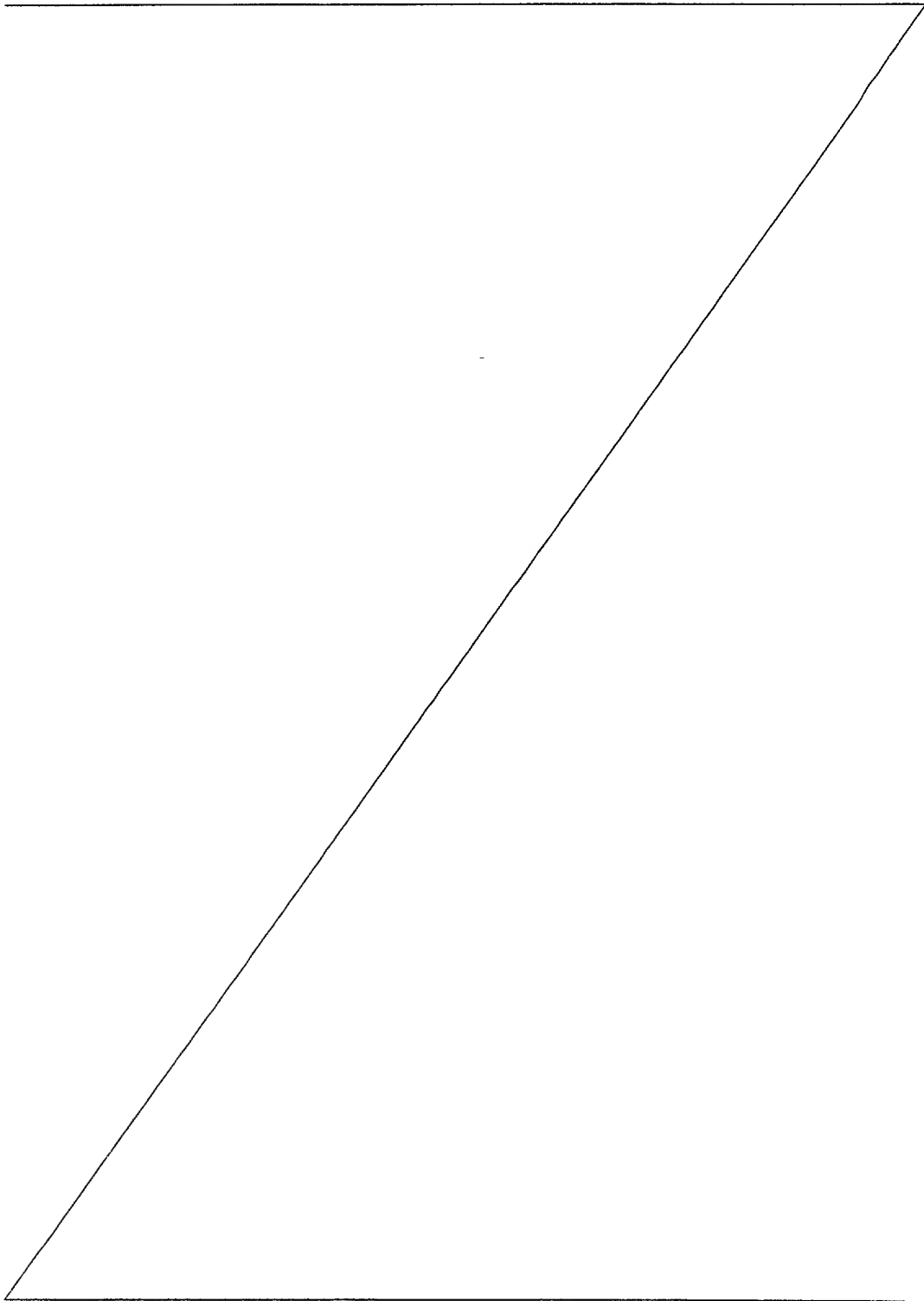


Figure 3 shows a schematic illustration of the frequency band breakdown for conventional parallel transmission of POTS and ADSL data, with Figure 3a showing ADSL-lite and Figure 3b showing ADSL-full.

According to the illustration in Figure 3a, the band from 0 to 4 kHz is reserved for the POTS voice band SB. The upstream channel DU for ADSL occupies the band from 25 to 138 kHz, while the downstream channel DD for ADSL occupies the band from 138 to 550 kHz.

According to the illustration in Figure 3b, the downstream channel for ADSL-full is extended up to 1100 kHz on the high-frequency side.

Various proposals describe the capability to use the frequency band between 0 and 25 kHz for ADSL purposes, if the telephone function in the band between 0 and 4 kHz is not required. Corresponding proposals use, for example, the information relating to the line state on the line card in the central office, and thus ensure rapid release of the frequency carriers in the voice band in the case of an incoming or outgoing call.

Further implementations leave not only the voice band up to 25 kHz but, furthermore, also the frequency band up to 100 kHz unused, and start ADSL transmission only at 120 kHz. Such methods relate to ADSL using 8 Mbit/s as the transmission rate.

The object of the present invention is to solve the problems relating to the ADSL functionality and installation problems which, in conventional systems, are caused by the analogue voice signal, the transition from going on hook and lifting the receiver, the lack of a POTS splitter, and the measurement pulse input.

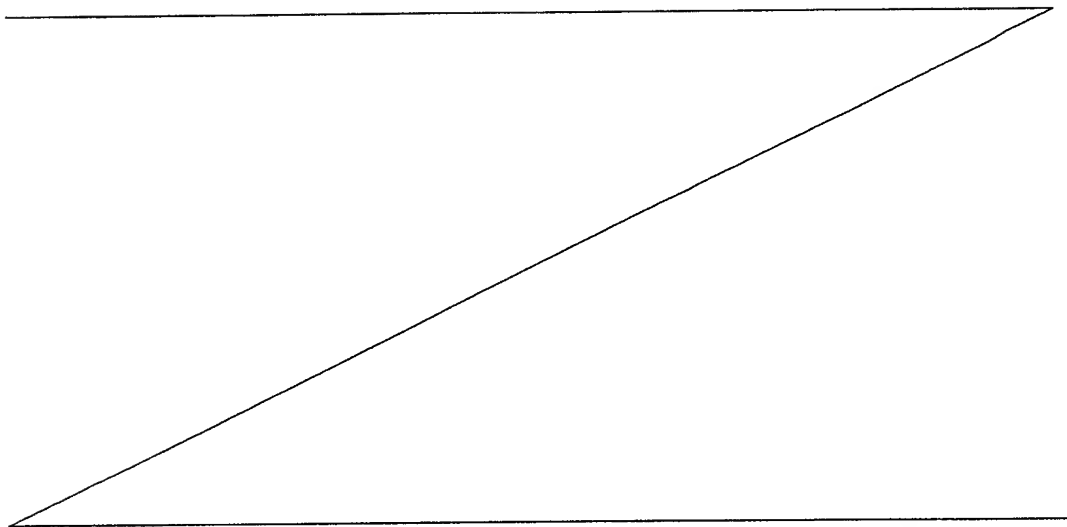
According to the invention, this object is achieved by the method specified in Claim 1 and by the apparatus specified in Claim 6.

5 The method according to the invention and the corresponding apparatus for joint transmission of ISDN and ADSL data have the advantage over the known solution approaches that a parallel complete ISDN service and a complete ADSL-lite/full service are
10 possible. No remote power feed is required for ISDN-NT operation.

The idea on which the present invention is based is to modulate the ISDN data into the ADSL band rather than
15 using two different modulation methods for transmission of ADSL and ISDN data. In other words, the ISDN data is packed into the ADSL data stream. In this case, the ISDN data stream is modulated onto carrier frequencies reserved for this purpose. This has advantages for
20 maintenance of the speech quality and desired delay times.

The dependent claims contain advantageous developments and improvements of the respective subject matter of
25 the invention.

According to one preferred development, the ISDN data stream in the mixed data stream is modulated into a frequency band between 0 and 138 kHz, preferably
30 between 0 and 25 kHz. This is precisely the frequency band which is currently not used by ADSL. The upper limit for the ADSL-modulated ISDN component can possibly be movable. According to one particularly preferred embodiment, the entire available bandwidth
35 from 0 to 25 kHz is used for duplex transmission at 144 kbit/s.



According to a further preferred development, the ADSL data stream in the mixed data stream in the current downstream direction is modulated into a frequency band between 138 and 1100 kHz, preferably between 138 and 550 kHz.

Exemplary embodiments of the invention are explained in more detail in the following description and are illustrated in the drawings, in which:

- Figure 1 shows a schematic illustration of the frequency band breakdown in a first embodiment of the invention, to be precise for ADSL-lite;
- Figure 2 shows a schematic illustration of a hardware configuration for the first embodiment of the invention; and
- Figure 3 shows a schematic illustration of the frequency band breakdown for conventional parallel transmission of POTS and ADSL data, to be precise with Figure 3a for ADSL-lite, and Figure 3b for ADSL-full.

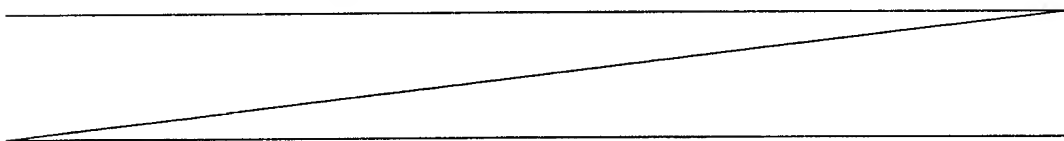


Figure 1 shows a schematic illustration of the frequency band breakdown for a first embodiment of the invention, to be precise for ADSL-lite, and Figure 2 shows a schematic illustration of a hardware configuration for the first embodiment of the invention.

In Figure 1, G denotes a common band with ADSL-ISDN, an ISDN region in the ADSL band, an ADSL-DU, and ADSL upstream region in the ADSL band, and ADSL-DD denotes an ADSL downstream region in the ADSL band.

The ISDN data stream in the mixed data stream is modulated into the frequency band G between 0 and 138 kHz, in this case between 0 and 25 kHz, as is illustrated by the dashed line. This limit may, however, be moveable. The ISDN data stream is in this case modulated onto ADSL carrier frequencies reserved for this purpose.

The ADSL data stream ADSL-DU in the mixed data stream in the current downstream direction is modulated above a frequency band provided for the ISDN data stream in the mixed data stream, that is to say between 25 and 138 kHz.

The ADSL data stream ADSL-DD in the mixed data stream in the current downstream direction is modulated above the frequency band provided for the ADSL data stream in the mixed data stream in the current upstream direction, in this case between 138 and 550 kHz.

The present embodiment of the invention thus uses the frequency spectrum, which was previously intended for the voice band, between 0 and 25 kHz for transmission of a number of voice channels in digital form. Since the frequency spectrum in the region of the ADSL ranges allows a transmission rate of more than 144 kbit/s, both applications can be implemented, which offer the

subscriber analogue telephone connections as well as an alternative ISDN connection.

The unused carriers in the frequency band between 0 and 25 kHz are used for transmission of voice/ISDN data. Since the transmission must be in full-duplex form, an echo deletion method is used in the lower spectrum up to 138 kHz. Specific methods such as trellis coding can be used for additional protection. In contrast to the ADSL data stream, no Reed-Solomon algorithm is used, in order to achieve short delay times. The hot-start capability known from ISDN can be achieved by selective activation or deactivation of the lower carriers.

In Figure 2, 10 denotes a subscriber connection and 20 a linecard of a central office. The subscriber connection 10 and the line card 20 of the central office are connected to one another by means of a transmission line 1020. 101 and 201, respectively, denote a respective ADSL modem for modulation/demodulation of a respective ISDN data stream 1012 or 2012 to form an ADSL data stream 1011 or 2011, respectively, and vice versa. In this case, 1011 denotes the ADSL data stream at the subscriber connection end 10, and 2011 denotes the ADSL data stream at the line card end 20. Furthermore, 1012 denotes the ISDN data stream at the subscriber connection end 10, and 2012 denotes the ISDN data stream at the line card end 20.

At the subscriber connection end 10, the ISDN data stream 1012 is supplied to an ISDN transceiver 102, which has a conventional ISDN bus (for example an SO bus) 1022 on the output side, which can be connected to an appropriate terminal, for example an ISDN telephone.

A respective analogue connection 1023 or 1024 (a/b) branches off from the ISDN data stream 1012 via a respective SLIC/CODEC device 103 or 104, and a

corresponding analogue terminal, for example an analogue telephone, can be connected to it. In order to provide an emergency power capability, the analogue connection 1024 can be connected by means of a relay 105 directly to the data transmission line 1020, so that it can be connected directly to the line to the line card 20. This relay 105 is expediently operated by the voltage supply, or by some other local control signal.

Although the present invention has been described primarily on the basis of preferred exemplary embodiments, it is not restricted to these embodiments but can be modified in many ways.

For example, the frequency bands can in principle be selected as required, and the ISDN data stream in the mixed data stream may also be accommodated in the current downstream band of the ADSL data stream.

The hardware configuration can also be represented differently, and is not restricted to the explained example.

PATENT CLAIMS

1. Method for joint transmission of ISDN and ADSL data between a first station (10) and a second station (20) via a transmission line (1020), having the following steps:

modulation of an ISDN data stream (1012) by means of an ADSL modulator (101) to form an ADSL data stream (1011) in the first station (10) for transmission as a mixed data stream in the current upstream direction to the second station (20), with the ISDN data stream in the mixed data stream in the current upstream direction being modulated onto carrier frequencies, which are reserved for this purpose, in a first frequency band, and the ADSL data stream in the mixed data stream in the current upstream direction being modulated above the first frequency band;

demodulation of the mixed data stream in the second station (20) by means of an ADSL demodulator (201) to form a corresponding transmitted ADSL data stream (2011) and a corresponding transmitted ISDN data stream (2012);

modulation of an ISDN data stream (2012) by means of an ADSL modulator (201) to form an ADSL data stream (2011) in the second station (20) for transmission as a mixed data stream in the current downstream direction to the first station (10), with the ADSL data stream in the mixed data stream in the current downstream direction being modulated in a second frequency band above the first frequency band; and

demodulation of the mixed data stream in the first station (10) by means of an ADSL demodulator (101)

to form a corresponding transmitted ADSL data stream (1011) and a corresponding transmitted ISDN data stream (1012).

5 2. Method according to Claim 1, characterized in that the first frequency band is between 0 and 138 kHz, preferably between 0 and 25 kHz.

10 3. Method according to one of the preceding claims, characterized in that the second frequency band is between 138 and 1100 kHz, preferably between 138 and 550 kHz.

15 4. Method according to one of the preceding claims, characterized in that the first frequency band has a moveable upper limit for the ADSL modulated ISDN data stream.

20 5. Method according to one of the preceding claims, characterized in that the first station (10) is a home station, and the second station (20) is a central office station.

25 6. Apparatus for joint transmission of ISDN and ADSL data by means of the method according to at least one of the preceding claims, having:

30 an ISDN transceiver (102), which is provided in the first station (10) for transmission and reception of the ISDN data stream (1012) and is connected firstly to the ADSL modulator (101) and secondly to an ISDN terminal, preferably an ISDN telephone.

35 7. Apparatus according to Claim 6, characterized in that at least one SLIC/CODEC device (103, 104) is provided in the first station (10), and is connected firstly to the ADSL modulator (101) and

secondly to an analogue terminal, preferably to an analogue telephone.

- 5 8. Apparatus according to Claim 7, characterized in that a relay device (105) is connected between the at least one SLIC/CODEC device (104) and the transmission line (1020), in order to provide an emergency power function.

1/2

FIG 1

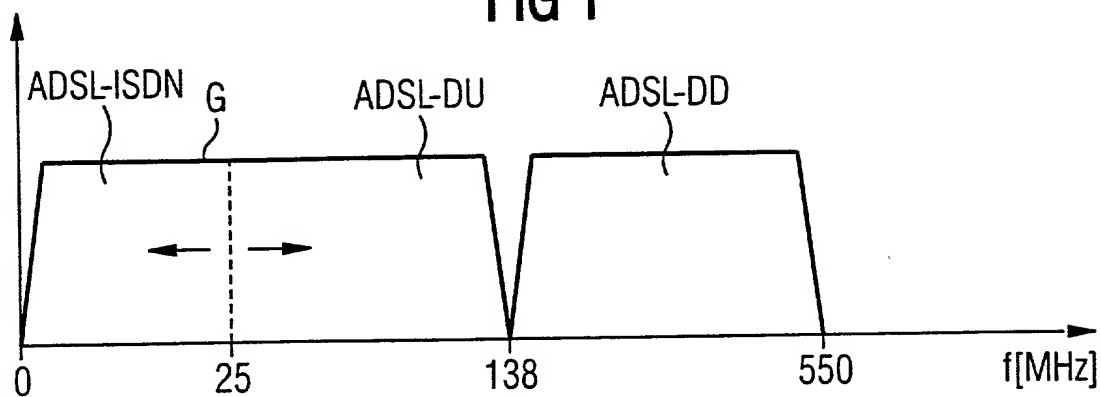


FIG 3A

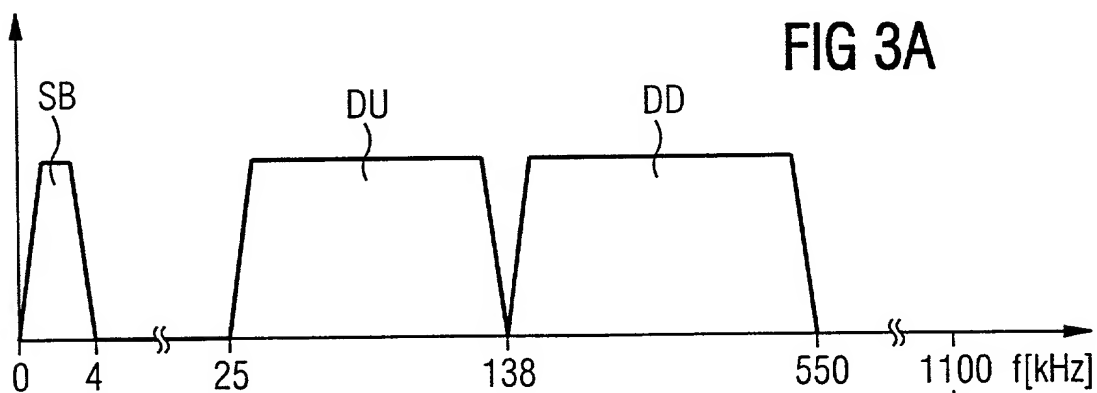


FIG 3B

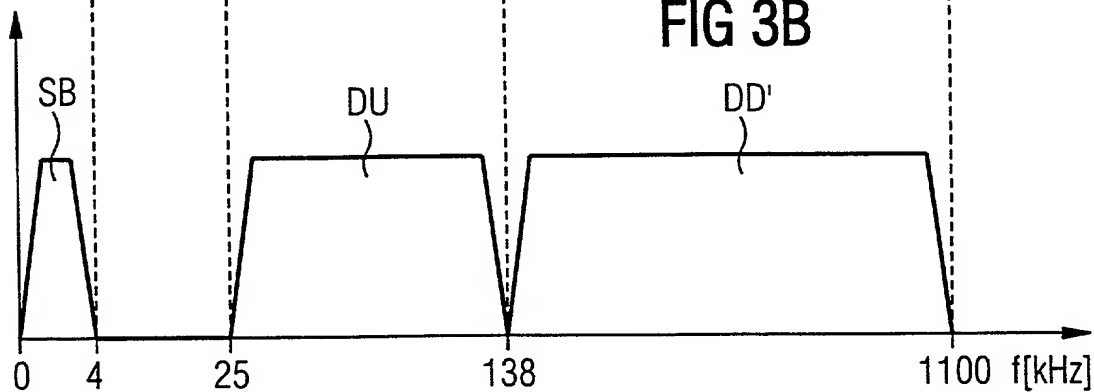
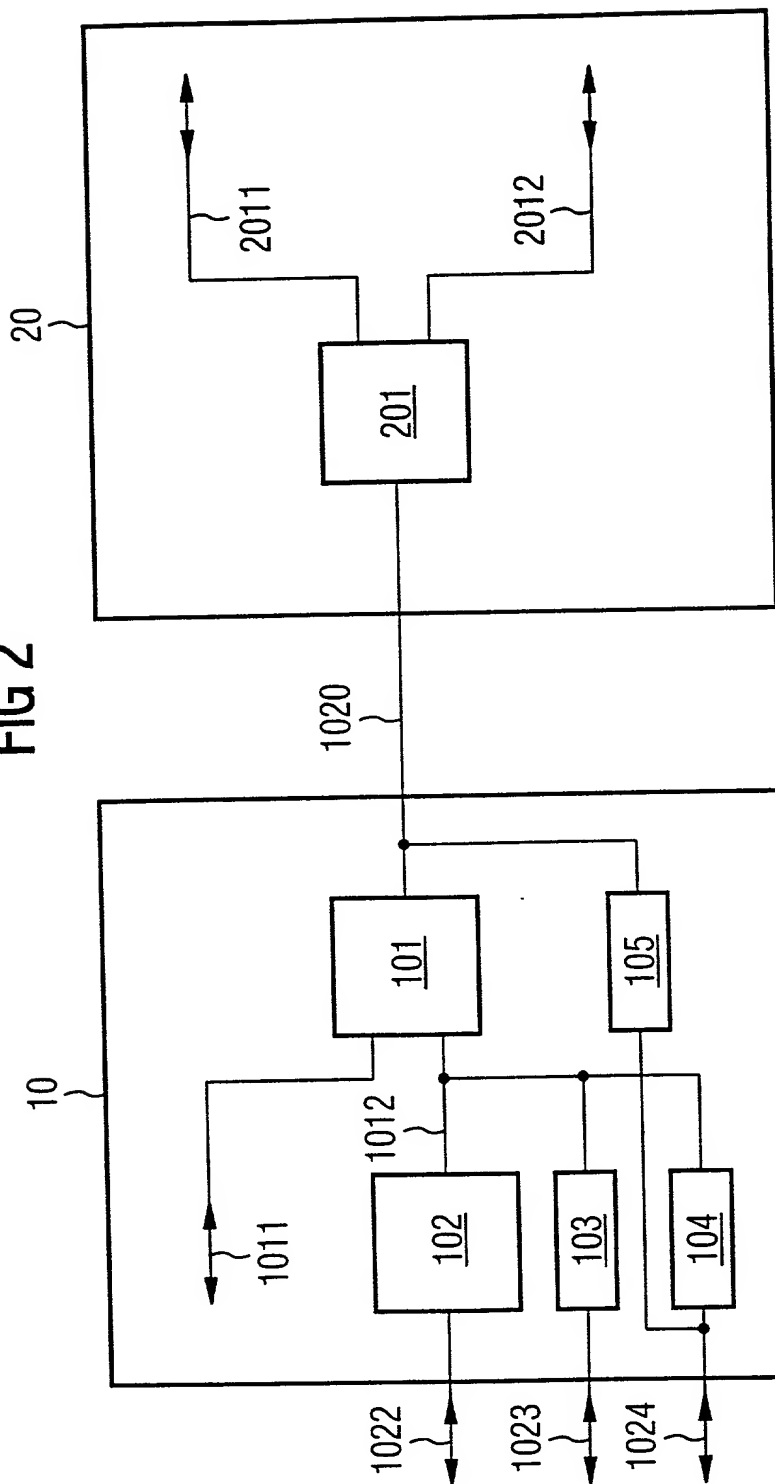


FIG 2



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